

**WHAT IS CLAIMED IS:**

1. A compound for supplementing the concentration of a parent androgen in a subject *in vivo*, the parent androgen having a skeletal structure including a 17 position and the parent androgen further having a 17 $\beta$ -hydroxy group comprising a 17 $\beta$ -hydroxy hydrogen appended to the 17 position, the compound comprising:

a substrate having the skeletal structure of the parent androgen including a 17 position corresponding to the 17 position of the parent androgen; and

a promoiety comprising an alkoxymethyl ether appended to the 17 position of the substrate as a substitute for the 17 $\beta$ -hydroxy hydrogen.

2. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of testosterone.

3. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of nandrolone.

4. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of dihydrotestosterone.

5. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of dihydronandrolone.

6. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen is

selected from the group consisting of (5 $\alpha$ ,17 $\beta$ )-17-hydroxy-androst-1-ene-3-one,

5 $\alpha$ -androst-1-ene-3 $\alpha$ ,17 $\beta$ -diol, androst-4-ene-3 $\alpha$ ,17 $\beta$ -diol, 5 $\alpha$ -androst-1-ene-3 $\beta$ ,17 $\beta$ -diol, androst-4-ene-3 $\beta$ ,17 $\beta$ -diol, and mixtures thereof.

7. A compound as set forth in claim 1, wherein the substrate has the skeletal structure of the parent androgen and wherein the parent androgen is  
5 selected from the group consisting of 5 $\alpha$ -19-nor-androst-1-ene-3 $\alpha$ ,17 $\beta$ -diol, 19-nor-androst-4-ene-3 $\alpha$ ,17 $\beta$ -diol, 5 $\alpha$ -19-nor-androst-1-ene-3 $\beta$ ,17 $\beta$ -diol, 19-nor-androst-4-ene-3 $\beta$ ,17 $\beta$ -diol and mixtures thereof.

8. A compound as set forth in claim 1, wherein the alkoxymethyl ether has an alkyl chain length of less than 11.

9. A compound as set forth in claim 1, wherein the alkoxymethyl ether has an alkoxy moiety consisting of methoxy.

10. A compound as set forth in claim 1, wherein the alkoxymethyl ether has an alkoxy moiety selected from the group consisting of ethoxy, butoxy, isopropoxy, isobutoxy t-butoxy, valeroxy, hexanoxy, heptanoxy, octanoxy, nonanoxy, decanoxy, undecanoxy, cyclopentoxy, cyclopentylpropoxy, and mixtures thereof.

11. A compound as set forth in claim 1, wherein the compound comprises (5 $\alpha$ ,17 $\beta$ )-17-methoxymethyloxyandrost-1-ene-3-ol.

12. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-4-ene-3-ol.

13. A compound as set forth in claim 1, wherein the compound comprises (5 $\alpha$ ,17 $\beta$ )-17-methoxymethyloxyandrost-1-ene-3-one.

14. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-4-ene-3-one.

15. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-1,4-diene-3-one.

5 16. A compound as set forth in claim 1, wherein the compound comprises (5 $\alpha$ ,17 $\beta$ )-17-methoxymethylestra-1-ene-3-one.

17. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethylestr-4-ene-3-one.

10 18. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethylestr-1-ene-3-ol.

19. A compound as set forth in claim 1, wherein the compound comprises 17 $\beta$ -methoxymethylestr-4-ene-3-ol.

20. A compound as set forth in claim 1, wherein the compound comprises (5 $\alpha$ -17 $\beta$ )-17-methoxymethylandrostan-3-one.

15 21. A compound as set forth in claim 1, wherein the compound comprises (5 $\alpha$ -17 $\beta$ )-17-methoxymethylestran-3-one.

22. A compound as set forth in claim 1, further including a carrier.

23. A compound as set forth in claim 1, wherein the carrier comprises a solid carrier.

20 24. A compound as set forth in claim 1, wherein the carrier comprises a liquid carrier.

25. A compound as set forth in claim 1, wherein the carrier comprises a semi-solid carrier.

26. A method for increasing concentration of a parent androgen in a subject *in vivo*, the parent androgen having a skeletal structure including a 17 position and the parent androgen further having a 17 $\beta$ -hydroxy group comprising a 17 $\beta$ -hydroxy hydrogen appended at the 17 position, the method comprising:

administering to the subject a compound comprising a substrate and a promoiety, the substrate having the skeletal structure of the parent androgen including a 17 position corresponding to the 17 position of the parent androgen, and the promoiety comprising an alkoxymethyl ether substituted at the 17 position of the substrate for the 17 $\beta$ -hydroxy hydrogen; and

converting the compound *in vivo* into the parent androgen.

27. A method as set forth in claim 26, wherein the subject is a human being and the *in vivo* conversion comprises converting the compound into the parent androgen *in vivo* within the human being.

28. A method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of testosterone.

29. A method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of nandrolone.

30. A method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of dihydrotestosterone.

31. A method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of dihydronandrolone.

32. The method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of the parent androgen wherein the parent androgen is selected from the group consisting of (5 $\alpha$ ,17 $\beta$ )-17-hydroxy-androst-1-ene-3-one,

5 $\alpha$ -androst-1-ene-3 $\alpha$ ,17 $\beta$ -diol, androst-4-ene-3 $\alpha$ ,17 $\beta$ -diol, 5 $\alpha$ -androst-1-ene-3 $\beta$ ,17 $\beta$ -diol, androst-4-ene-3 $\beta$ ,17 $\beta$ -diol, and mixtures thereof.

33. A method as set forth in claim 26, wherein the compound administration comprises administering the compound so that the substrate has the skeletal structure of at least one of 5 $\alpha$ -19-nor-androst-1-ene-3 $\alpha$ , 17 $\beta$ -diol, 19-nor-androst-4-ene-3 $\alpha$ -17 $\beta$ -diol, 5 $\alpha$ -19-nor-androst-1-ene-3 $\beta$ ,17 $\beta$ -diol,19-nor-androst-4-ene-3 $\beta$ ,17 $\beta$ -diol.

34. A method as set forth in claim 26, wherein the alkoxymethyl ether has an alkyl chain length of less than 11.

35. A method as set forth in claim 26, wherein the alkoxymethyl ether has an alkoxy moiety consisting of methoxy.

36. A method as set forth in claim 26, wherein the alkoxymethyl ether has an alkoxy moiety selected from the group consisting of ethoxy, butoxy, isopropoxy, and isobutoxy, t-butoxy, valeroxy, hexanoxy, heptanoxy, octanoxy, nonanoxy, decanoxy, undecanoxy, cyclopentoxo, cyclopentylpropoxy, and mixtures thereof.

5 37. A method as set forth in claim 26, wherein the alkoxymethyl ether comprises methoxymethyl ether.

38. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-1-ene-3-ol.

39. A method as set forth in claim 26, wherein the compound comprises  
10 (5 $\alpha$ ,17 $\beta$ )-17-methoxymethyloxyandrost-4-ene-3-ol.

40. A method as set forth in claim 26, wherein the compound comprises (5 $\alpha$ ,17 $\beta$ )-17-methoxymethyloxyandrost-1-ene-3-one.

41. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-4-ene-3-one.

15 42. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethyloxyandrost-1,4-diene, 3-one.

43. A method as set forth in claim 26, wherein the compound comprises (5 $\alpha$ ,17 $\beta$ )-17 $\beta$ -methoxymethylestr-1-ene-3-one.

20 44. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethylestr-4-ene-3-one.

45. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethylestr-1-ene-3-ol.

46. A method as set forth in claim 26, wherein the compound comprises 17 $\beta$ -methoxymethylestr-4-ene-3-ol.

5 47. A method as set forth in claim 26, wherein the compound comprises (5 $\alpha$ -17 $\beta$ )-17-methoxymethylandrostan-3-one.

48. A method as set forth in claim 26, wherein the compound comprises (5 $\alpha$ -17 $\beta$ )-17-methoxymethylestran-3-one.

49. A method as set forth in claim 26, wherein the compound  
10 administration comprises peroral administration.

50. A method as set forth in claim 26, wherein the compound administration comprises pernasal administration.

51. A method as set forth in claim 26, wherein the compound administration comprises transdermal administration.

15 52. A method as set forth in claim 26, wherein the compound administration comprises injecting the compound into the subject.

53. A method as set forth in claim 26, wherein the compound administration comprises administering the compound sublingually.

20 54. A method as set forth in claim 26, wherein the compound administration comprises complexing the compound with an hydroxypropyl beta cyclodextrin.

55. A method as set forth in claim 26, wherein the compound administration comprises complexing the compound with an hydroxypropyl gamma cyclodextrin.

56. A method as set forth in claim 26, wherein the compound  
5 administration comprises administering a dosage periodically for a maximum of two weeks, followed by at least two weeks of non-administration to permit recovery of natural parent androgen production in the subject.

57. A method as set forth in claim 26, wherein the compound administration comprises administering the compound only in morning-time.

58. A method as set forth in claim 26, wherein the compound  
10 administration comprises administering the compound in an amount ranging from 1.0 mg to 500 mg per day.

59. A method as set forth in claim 26, wherein the compound  
15 administration comprises administering the compound in an amount ranging from 50 mg to 300 mg per day.

60. A method as set forth in claim 26, wherein the compound administration comprises administering the compound in an amount ranging from 50 mg to 100 mg per day.

61. A method as set forth in claim 26, wherein the compound  
20 administration further includes applying an enteric coating to the compound prior to administering the compound.